

MORPHOMETRICAL AND ANATOMOPATHOLOGICAL SURVEY OF THE BURSA OF FABRICIUS IN BROILER CHICKENS

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Introduction

The bursa of Fabricius is an immunological organ that plays a primordial role in the poultry immunity (Toivanen et al 1987). It is according to its physiological state that will especially depend on the immune status of poultries at the beginning of broiler chickens weight development. The different aggressions of the environment (stress, bad hygiene, vaccination, pathologies...) undergone by birds, influential on the anatomical and physiological development of the bursa of Fabricius. It can, therefore, lead to an immunodepression at certain birds. The use of vaccines called virulent "warm" can sometimes compromise immunity at poultries while causing some lesions of this organ (OIE 2001, van Denberger et al 2000). The consecutive immunodepression to lesions of this vital organ provokes very often negative vaccinal reactions and some complications in poultry flocks: bad absorption, secondary infection, weak gain of weight and finally diverse diseases. In this survey, we valued morphometrical and histological evolution of the broiler cloacal bursa in the natural conditions.

Material and methods

The investigation is done on nine flock poultry of 3000 broilers each, elevated in open broiler houses and vaccinated against the infectious bursal disease (IBD) with a vaccine "*Intermediate plus*". Morphometrical survey of the bursa of Fabricius has been done thanks to the method of Kuney (1982). Broilers are weighed then sacrificed during raising. The autopsy is achieved on broiler chickens presenting no clinical sign of disease. The bursa of Fabricius are taken, examined, weighed and measured with the help of a "*bursameter*" (Fig.1). The calculation of bursal index (BI) is obtained by the following formula: weight of Fabricius bursa / body weight x 100.

Histological cuts of Fabricius bursa are prepared from broiler chickens of every flock according to the conventional method (Campell, 1995). Histopathological observation is

realized thanks to an optic microscope AXIOSCOPZO - ICS - Zeiss. For the assessment of broiler chickens immune status, we used the method developed by Solvay (1992) based on the degree of severity of lymphocyte depletion in the medullary follicular zone of this organ.

Results and discussion

The bursal index (BI) calculated during all the period of raising (49 day) for the 9 flocks of broiler chickens demonstrates that more than the half belong to the bad class (57.63%) and only a quarter belongs to the one excellent (27.75%), what confirms the heterogeneity of poultry flocks (Table 1).

The evolution of the bursal weight with regard to the body weight gives a correlation coefficient $r^2 = 0.54$ (Fig. 2). It is a positive and significant correlation ($p \leq 0.001$), what explains that the weight of the bursal increased effectively according to the body weight, but without reaching some compliant values. This variation of the bursal morphology demonstrates the immunodepression state at certain broilers chickens (Table 2). Lesionel score survey demonstrated that more than the half (53%) of the examined organs present lesions of different degrees. The distribution of the observed lesions is very variable within the different flocks and even inside of one same flock. They are especially characterized by atrophy, lymphocyte depletion. In the more serious cases, one notes a follicular lymphoid necrosis, an interfollicular interstitial fibrosis and a degeneration of the coating epithelium (not mentioned). The observed lesions of Fabricius bursa are caused by a wild virus of IBD having infected broiler chickens since their arrival in the badly decontaminated buildings or by the vaccinal strain called "*Intermediary plus*". Researches demonstrated, that in spite of an elevated rate of maternal antibodies at broiler chicks, it can have precocious and lasting colonization of the bursa of Fabricius there by a wild strains (Allamigeon and Count, 2003). It exists an optimum moment of difficult vaccination to determine, it is necessary sufficiently of maternal antibodies to master a possible wild strain but not too much to not neutralize the vaccinal virus (Goutebroze and al. 2003; Lemièrè 2003). Boudaoud (2004) demonstrated the immunodepression and pathological state caused of *intermediate Plus* vaccine strains against IBD with regard to those so-called *intermediate*.

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Table 1 – Bursal index (BI) in broiler flocks (%)

Class Flock	BI > de 0.20%	0.18% < BI < 0.20%	0.15% < BI < 0.18%	BI < de 0.15%
	(excellent)	(average)	(mediocre)	(bad)
1	28.12	3.12	3.12	62
2	19	4.76	4.76	71.42
3	40.9	4.54	4.54	50
4	22.22	11.11	22.22	44.44
5	27.77	11.11	11.11	50
6	31.25	0	0	68.75
7	18.75	6.25	6.25	68.75
8	6.22	0	6.45	61.29
9	31.57	10.5	10.5	42.1
Mean	27.75	5.71	7.96	57.63

Table 2 – Lesional score of Fabricius bursae in poultry broilers (n = 62)

*Lesional score	0	1	2	3	4
% of Fabricius bursae affected	47	10	5	32	6

* 0 = normal, 1 = <15% of lymphoid follicles depletion, 2 = 15-30%, 3 = 31-60%, 4 = >61%

Figure 1- Bursameter (Solvay animal health, 1992)

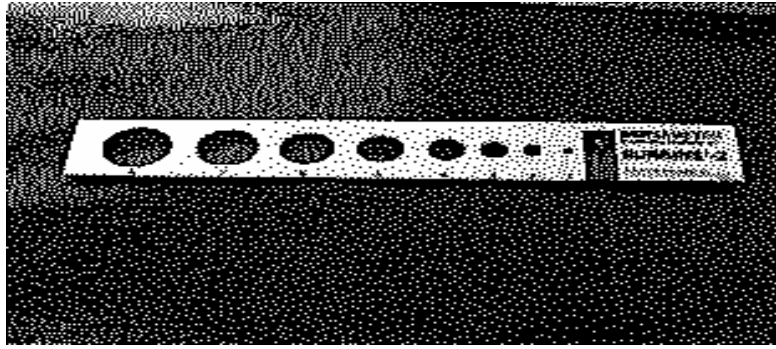


Figure 2. Correlation between body weight and bursal weight in the broiler chickens

